Assessment:

Choose one of four _scenarios_ (1-4) below

Then you are going to write an assessment around the one you chose, weighing up the evidence supporting the claims and citing evidence against it:

To answer this you need to

- _Understand what is being discussed (session 1, 2)_
- _Find out what other evidence supports or disproves what is being said by looking at what else that is relevant has been written about the topic. (session 3, 4)_
- _This will require a literature search using appropriate search terms on appropriate databases. You will need to reference all the literature that you cite to support your argument. (session 3)_
- _Your conclusion will state your support or not for what is being said. You will have reached that conclusion by using the evidence you find and appraising it_! (session 4, 5)

Introduction **200-300 words:**

- **What is the research and findings described in the scenario?**
- **Why is it being done?**
- **What is being linked/proposed?**

This will require looking at some _epidemiology_- who gets it, numbers of people with it and how they are proposing that one thing impacts on another.

Method about 100-200 words

Find evidence that _supports and evidence that disproves_ what the paper in the scenario you have chosen is claiming- this will require a literature search.

Say

- **how you did the search,**
- **which _data -bases_ you used'**
- **which _terms_ you used,**
- **the _date range_ for searching (eg 2008-2018) and**
- **the _number_ of journal papers you are including (should be about 10 journal papers)**

Main body of essay 700-900 words.

Sum up the research and findings in the scenario. What sort of evidence is being shown? How was the research done? What were the problems with it? Use the examples from the NHS links in the assessment folder to show how to do this.

From the methods- find papers that support the findings and those that don't support the findings. Sum up the evidence from these papers for and against the claim of the scenario.

Conclusion 200- 300 words

Do you support the scenario or not? Why?

Word counts for each section are *approximate.*

2000 words + References (Harvard style!)

Scenarios 1-4 are below. Choose one!

Scenario 1

What is the relation between baby boomers and hepatitis C?

Hepatitis C is a liver infection caused by the hepatitis C virus. Hepatitis C is transferred through the blood, with most cases of infection resulting from drug use and sharing needles. Baby boomers — those born between 1945 and 1965 — make up 80 percent of all chronic hepatitis C cases in the United States, according to research published in the American Journal of Preventive Medicine.

Hepatitis C can be a short-term condition for some people, but for 70–85 percent, it becomes a chronic, long-term infection. Hepatitis C can go undiagnosed for a long time and can lead to serious health consequences. In the 1980s, around 6 percent of people who had hepatitis C were cured. Today, however, the cure rate is around 80–90 percent. Unlike hepatitis A and B, there is no vaccine for hepatitis C.

Hepatitis C is likely to be so common among baby boomers due to the standard of medical practices in the past rather than lifestyle choices. Baby boomers are advised to get tested for hepatitis C due to high rates of the disease within this age group. Despite the high number of baby boomers with hepatitis C in the U.S., most people with the infection are not aware that they have it. Undiagnosed hepatitis C is a significant issue, as the disease can lead to cirrhosis, liver cancer, and death. For these reasons, in 2013, the U.S. Preventive Services Task Force recommended a one-time hepatitis C screening for all adults within the baby boomer age bracket.

The high rate of hepatitis C among baby boomers is probably the result of some medical practices of the past. A 2016 study published in The Lancet found that most of the spread of hepatitis C occurred roughly between 1940 and 1965. The researchers concluded that this spread likely occurred in hospitals, rather than as a result of lifestyle choices as many people thought.

Another article from the same edition of The Lancet notes that during the highest infection period from 1945 to 1965, glass and metal syringes were commonly reused, which would provide plenty of opportunity for infection.

The authors wrote: "The medical community can now take its share of the responsibility for hepatitis C virus infection."

These findings show a completely different pattern to what is seen today, where most new hepatitis C infections are linked to drug use. According to the Centers for Disease Control and Prevention (CDC), around one-third of injectable drug users aged 18–30 have hepatitis C. This number rises to 70–90 percent in older and former users.

These different causes of infection between past and present explain why many baby boomers might feel stigmatized by the condition. Some may not even consider themselves to be at risk in the first place.

Scenario 2

Heart failure risk might depend on your neighbourhood

The risk of developing heart failure is highly dependent on diet, lifestyle, and genetics. A new study, however, suggests that where we live may also play a key role. Researchers suggest that our neighbourhoods play a role in our risk of heart failure. Researchers discovered that people who lived in deprived areas were more likely to develop heart failure than individuals who resided in wealthier areas.

Co-senior study author Dr. Elvis Akwo, who is a postdoctoral research fellow from Vanderbilt University Medical Center in Nashville, TN, and colleagues note that previous research has shown that a person's individual socioeconomic status can have negative health implications.

But the team says that this new study shows that the socioeconomic status of one's neighbourhood can also affect heart failure risk. The researchers recently published their findings in the journal Circulation: Cardiovascular Quality and Outcome.

Heart failure occurs when the heart is no longer able to pump enough oxygen-rich blood to aid the functioning of other organs. According to the Centers for Disease Control and Prevention (CDC), it affects around 5.7 million adults in the United States.

While there is currently no cure for heart failure, lifestyle changes, medications, and surgery are some of the treatments that can help to prolong survival. Still, around 50 percent of people with heart failure die within 5 years of being diagnosed. As such, it is important to identify all risk factors for heart failure, as this guides us toward strategies that can help to prevent the condition.

From their study, Dr. Akwo and his colleagues believe that they have identified a person's place of residence as a risk factor for heart failure.

In order to reach their findings, the researchers analysed the data of 27,078 adults aged 40–79. All subjects were part of the Southern Community Cohort Study, which is a health study of adults across 12 states in southeastern America, between 2002 and 2009. Around 69 percent of the participants were African-American, and around 63 percent were women.

The team divided the subjects into three groups, ranging from those who lived the least-deprived neighbourhoods to those who lived in the most deprived. Subjects were followed-up for a median of 5.2 years. During this time, a total of 4,300 participants developed heart failure.

The researchers found that adults who lived in the most deprived areas had the highest incidence of heart failure, at 37.9 per 1,000 person-years, compared with 28.4 per 1,000 person-years for those who lived in the least-deprived areas.

After adjusting for participants' age, sex, race, and lifestyle and clinical factors, the scientists found that each tier jump in neighbourhood deprivation — from the least deprived to the most deprived — was associated with a 12 percent increase in heart failure risk.

Overall — after further adjustment for subjects' education and income — the team calculated that a person's place of residence accounted for 4.8 percent of their heart failure risk.

"There is existing evidence," notes co-senior study author Loren Lipworth, an associate professor of epidemiology at Vanderbilt University Medical Center, "suggesting strong, independent associations between personal socioeconomic status — like education, income level, and occupation — and risks of heart failure and many other chronic diseases."

"But what this study adds," she explains, "is evidence suggesting that characteristics of your place of residence, actually also play a significant role in influencing the risk of heart failure over and above the role of your own individual socioeconomic characteristics."

The researchers note that because their study mainly focused on middle-aged individuals with low income, the results cannot be generalized to other populations just yet.

Still, they hope that their results will encourage community-based interventions that can help individuals to reduce their risk of heart failure.

"Public policy professionals need to pay attention to the neighbourhood, not just the individuals, because your place of residence does predict your risk of heart failure. Improved community-level resources may ultimately reduce the risk of heart failure in these communities."

Dr. Elvis Akwo

"These are merely suggestions on what could have some impact," Dr. Akwo goes on to explain. "We hope that our study will open the door for experimental studies for interventions and what kinds of measures can be tested to improve the cardiovascular health of entire communities," instead of, he says, "just one person at a time."

Scenario 3

Walk 4,000 steps every day to boost brain function

Recent research led by the University of California, Los Angeles shows that taking a short walk each day can help to keep the brain healthy, supporting the overall resilience of cognitive functioning. Could a walk in the park help to maintain cognitive health in old age?

As we grow older, memory problems can begin to set in. These could be a natural part of aging and a minor annoyance, but in some cases, the issues may indicate mild cognitive impairment and could even develop into dementia.

Regardless of how mild or severe these memory problems may be, they are definitely distressing and can affect an individual's quality of life.

New research from the Semel Institute for Neuroscience and Human Behavior at the University of California, Los Angeles suggests that there is a relatively easy way of keeping your brain in top shape as you grow older: take a moderately long walk every day.

This could boost your attention, the efficiency with which you process information, and other cognitive skills, say first study author Prabha Siddarth and colleagues. The research findings were recently published the Journal of Alzheimer's Disease.

Siddarth and team initially recruited 29 adults aged 60 and over, of which 26 completed the study over a 2-year period. The participants were split into two distinct groups:

- a low physical activity group, comprising people who walked 4,000 or fewer steps each day
- a high physical activity group, made up of people who walked more than 4,000 steps per day

All the participants reported a degree of memory complaints at baseline, but none of them had a dementia diagnosis.

In order to explore the potential effect of physical activity on cognitive ability, the researchers used MRI to determine the volume and thickness of the hippocampus, which is a brain region associated with memory formation and storage, and spatial orientation.

Previous research suggested that the size and volume of this brain region can tell us something about cognitive health. For instance, a higher hippocampal volume has been shown to indicate more effective memory consolidation.

"Few studies have looked at how physical activity affects the thickness of brain structures," says Siddarth.

"Brain thickness," she notes, "a more sensitive measure than volume, can track subtle changes in the brain earlier than volume and can independently predict cognition, so this is an important question."

In addition to the MRI scans, the participants also underwent a set of neuropsychological tests, to consolidate the assessment of their cognitive capacity. It was found that those in the high physical activity group — who walked more than 4,000 steps (approximately 3 kilometers) each day — had thicker hippocampi, as well as thicker associated brain regions, when compared with that of the those falling under the low physical activity category.

The highly active group was also found to have better attention, speedier information processing abilities, and more efficient executive function, which includes working memory. Working memory is the resource that we tap into on a daily basis when we need to make spontaneous decisions.

However, Siddarth and colleagues reported no significant differences between the high activity and low activity groups when it came to memory recall.

The next step from here, the researchers suggest, should be to undertake a longitudinal analysis in order to test the relationship between physical activity and cognitive ability over time. They also note the need to better understand the mechanisms behind cognitive decline in relation to hippocampal atrophy.

Scenario 4

How does excess weight drive breast cancer?

Obesity is a known risk factor for breast cancer, but precisely how does excess weight drive the disease? A new study has shed some light, revealing the process by which obesity increases the aggression of breast cancer cells. Researchers reveal how obesity may promote breast cancer metastasis.

By studying mouse and human breast cancer tissue, researchers discovered an increase in blood levels of specific cytokines — which are proteins secreted by immune cells — that reduce the activity of an enzyme called acetyl-CoA-carboxylase 1 (ACC1). This process leads to a build-up of a fatty acid precursor called acetyl-CoA, which increases the metastatic ability of breast cancer cells — that is, their ability to spread to other parts of the body. Interestingly, the team found that the secretion of ACC1-inhibiting cytokines was significantly higher in breast cancer tissue from patients who were obese.

Study co-leader Dr. Stephan Herzig — director of the Institute for Diabetes and Cancer at Helmholtz Zentrum München and a professor of molecular metabolic control at Technische Universität München in Germany — and colleagues recently reported their findings in the journal Cell Metabolism.

Breast cancer is the most common cancer to affect women in the United States after skin cancer. This year, it is estimated that there will be around 252,710 new cases diagnosed in U.S. women, and around 40,610 women will die from the disease. The vast majority of breast cancer deaths are caused by metastasis, wherein breast cancer cells spread to other areas of the body, such as the lungs or bones.

Being overweight or obese is a well-established risk factor for breast cancer. In fact, after going through menopause, women who are obese are 20–40 percent more likely to develop breast cancer than women of a healthy weight. Obesity has also been associated with an increased risk of breast cancer metastasis and reduced survival from the disease. However, the exact mechanisms underlying the link between obesity and breast cancer have been unclear.

To find out more, Dr. Herzig and colleagues investigated the activity of the enzyme ACC1 in mouse-derived breast cancer cell lines, as well as in breast tissue taken from patients with metastatic breast cancer. Previous studies have indicated that ACC1 — which plays a role in the synthesis of fatty acids — may be involved in cancer metastasis.

The analysis revealed that metastatic breast cancer cells have reduced ACC1 levels compared with healthy cells, especially among obese subjects. The reduction in ACC1 leads to an accumulation of acetyl-CoA. The build-up of acetyl-CoA modifies transcription factors — or proteins that regulate gene expression — in a way that promotes breast cancer metastasis. Further investigation revealed that obesity leads to an increase in the release of two cytokines, called leptin and transforming growth factor beta, into the bloodstream. These cytokines inhibit ACC1 in breast cancer cells. The researchers then used an antibody to block a pathway associated with leptin

release in human breast cancer cell lines, which, in turn, prevented ACC1 inhibition. They found that this prevented the cancer cells from metastasizing.

Based on their results, the researchers believe that they may have uncovered a potential new therapy for breast cancer. "Blocking the signalling pathways and switching off the metastasis-related genes could be a therapeutic target. As part of the so-called 'neo-adjuvant' therapy, the risk of metastases or the recurrence of tumours could be reduced prior to the surgical removal of the tumour." Dr. Stephan Herzig